DOCUMENT RESUME

ED 029 846 SP 002 683

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Goal Oriented Teaching Exercise (G.O.T.E.): Methodology for Measuring the Effects of Teaching Strategies.

Pub Date Feb 69

Note-20p.; Paper prepared for the American Educational Research Association Annual Meeting, Los Angeles, California, February 1969.

EDRS Price MF-$0.25 HC-$1.10

Descriptors-Academic Achievement, *Research Methodology, *Teacher Behavior

Identifiers-Goal Oriented Teaching Exercise, GOTE, Observation Schedule and Record 5V, OScAR 5V

To test the effectiveness of the Goal Oriented Teaching Exercise (GOTE), a six-day unit for measuring the effects of teaching strategies, four junior high school teachers received a teachers manual, information on instructional goals and subject content, and sample test questions all keyed to a content grid (formed by six content topics and two instructional goals--recall and application) for a teaching unit. Each teacher administered a pretest, also keyed to the grid, to students in two of his classes, and planned and taught lessons over a four-day period to one of these classes for recall and to the other for application. These lessons were observed and rated using the Observation Schedule and Record (OScAR) 5V. On the sixth day, a posttest (also keyed to the content grid) was administered to the students, and results were compared with those of the pretest revealing differences in pupil learning by teachers and also by goal. Audio tapes of the lessons were used to code psychological-social behavior of teachers (using OScAR), content covered, and type of instructional goal, and a visual display of interaction between these three types of teacher behavior was prepared. Teacher verbalism frequencies were tallied into content grid cells to show content coverage, and analyzed by goal, teacher, and observer visit revealing significant goal, visit, and observer, revealing 21 keys which reliably identified significant differences between teachers. (Appended are the 68 items of the OScAR 5V.) (SM)

ED029846

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# GOAL ORIENTED TEACHING EXERCISE (G.O.T.E.): Methodology for measuring the effects of teaching strategies

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February, 1969

SP002683

# GOAL ORIENTED TEACHING EXERCISE (G.O.T.E.):
## Methodology for measuring the effects of teaching strategies

This pilot study reports the development of a device primarily designed for research in teaching effectiveness. Hopefully, it may also be developed into an instrument useful for exploration of teaching strategies, for evaluation of instruction, and for teacher-training.

## DESCRIPTION

A Goal Oriented Teaching Exercise (G.O.T.E.) seeks to relate patterns of teacher behavior to pupil gains. A complete GOTE consists of (1) a four-day teaching unit, (2) specific objectives for pupils, (3) tests to measure pupil gains toward these specified objectives, (4) suggested teaching strategies, (5) instrumentation to describe teacher behavior, and (6) procedures for relating pupil gains to patterns of teacher behavior.

In this pilot study four teachers were asked to teach a unit on Air Pollution for specified content objectives. The unit content was organized along two dimensions: substantive content (e.g. causes, effects, etc.) and types of instructional goals (i.e. application and recall) to form twelve (12) content cells. Pupil gains were measured druing the teaching unit by equivalent forms of a test administered before and after the unit was taught. Teacher behavior was recorded three ways: by process, by substantive content, and by instructional goal. Each statement of the teacher was coded (1) using the OScAR 5V for information about social-psychological interaction, (2) by reference to the content cells of the total unit, and (3) by instructional goals. The pupil achievement data was then related to the measures of teacher behavior cell by cell. The data produced offered grounds for drawing inferences both about teaching strategies and their effects on pupils.

## RATIONALE

The GOTE procedure builds upon four assumptions. The first assumption is that the teaching act is a complex multi-dimensional activity, and further, that teaching activities are interactions between cognitive materials, goals of instruction, and teacher behavior. Secondly, researchers can profitably invest in the development of more complex instrumentation designed to describe these dimensions and their interaction. Presently we have a series of first generation instruments for observing teacher behavior. These instruments must now be related to other kinds of measures to create new, more complex methodologies for describing and evaluating the complexity of the teaching act. The third assumption is that a description of the cognitive activities or content activities of the teacher is an important variable of the teaching act. This is suggested by Bellack (1966) in his study of teaching effectiveness when he points

out that it is important to describe or control the "content coverage" of the materials taught during his research upon teacher effectiveness. The fourth assumption is that control of the content can be developed through careful pre-planning wherein the content grid can become the basis for describing "teacher coverage" of the subject matter. It also can become the specification for diagnostic content measures of the student's achievement.

## DESCRIPTION OF GOTE MATERIALS

GOTE materials were designed to accomplish three tasks. The first of these was to communicate the purposes and objectives of the study to the teachers who participated in the pilot study. The second task was to offer the participating teachers information and prescriptions which could guide them in carrying out these objectives. The third task was that of developing instruments that could measure the behavior of teachers and students.

Efforts were made to develop materials which would allow replication of the GOTE. This objective grew out of the hope that the GOTE methodology would grow and become a standardized procedure. The functional effect of this value is illustrated in the care given to developing a manual presenting the purposes and objectives of the GOTE study to the participating teachers. The same job could have been done with less effort via verbal communication with the small number of teachers involved in this initial effort. However, efforts were invested in developing a manual which could be used again. In all, there were five kinds of materials used and/or developed. They included: (1) a manual for teacher use, (2) a resource unit for the teaching activities, (3) a statement of goals and sample test items, (4) four equivalent forms of the subject matter test, and (5) OScAR 5V , a teacher behavior observation instrument.

The Teachers Manual presented the purposes of GOTE to the teachers who taught the units to be observed. The manual contained a discussion of procedures and the rationale of the GOTE activity. The concerns and the anxieties of the teachers were taken into account by a series of questions and answers which included, "How do I explain these activities to my class?" "Will this disrupt my class?" and "How can I get help in designing my teaching plan?" The objective of this manual was to communicate with the participating teachers in a professional manner, and to secure their understanding and cooperation.

The Resource Unit consisted of three parts. The first part presented statements and illustrations of the two instructional goals of "recall" and "application". (Bloom 1956). The theory was briefly discussed. Sample test items were included to assist in drawing the distinctions.

The second part of the resource unit specified the subject content to be taught in the space of four days. The subject chosen for this initial GOTE was that of "Air Pollution". This topic was chosen for three reasons: (1) it was a relatively new topic and students had not been exposed to it previously, (2) it could be justified in the context of a general science junior high curriculum as a current events topic, and (3) it had an appeal and interest for both students and teachers.

The informational content to be taught concerning Air Pollution was organized into a "content grid". This content grid had twelve (12) cells divided by instructional goal and by topic. (Figure 1)

FIGURE 1

GOTE CONTENT GRID FOR AIR POLLUTION

| CONTENT ORGANIZATION | INSTRUCTIONAL GOAL (1) Recall | (2) Application |
|---|---|---|
| 1. Sources of Air Pollution | 11 | 12 |
| 2. Methods of Measurement | 21 | 22 |
| 3. Causes of Air Pollution | 31 | 32 |
| 4. Special Effects of Air Pollution | 41 | 42 |
| 5. General Effects of Air Pollution | 51 | 52 |
| 6. Control of Air Pollution | 61 | 62 |

These cells became the organizing structure for the GOTE content materials. Teachers were given objectives and sample test questions keyed to these cells to help them target their instruction. Material and background information was related to each cell. Events observed in the classroom were also related to these 12 cells.

The third, or resource,phase of the unit included content objectives, reading materials for the teacher outlining the content information and suggested experiments for class use. A packet of materials was also included. It contained material aimed at the level of the pupils such as

visual aids and readings for class use. Again, all of these content materials were keyed to the cells of the content grid.

Sample test questions were presented to each teacher. They served to illustrate the way their students would be tested for content knowledge and for educational goals. The objective was to help the teachers understand what they should teach. They were to be encouraged to do their best to get the best results possible from their children.

Content tests were developed for the purpose of measuring pupil gains on a pre and post test basis. Four equivalent forms of twenty-six (26) items were created. Two or more items in each test were keyed to each cell of the afore mentioned "content grid". This test design yielded not only a single total score indicating how much a pupil has learned, but also diagnostic information about the kinds of things he has learned, so that gains made by a class during the exercise can be described both in terms of amount and pattern. It is conceivable that two classes might show the same amount of gain on a test (as measured by mean gains) although they have learned quite different things from teachers who have used quite different strategies. Such occurrences can have devastating effects on correlation between pupil gains and teaching behaviors. This test structure was designed to obviate this problem.

It should be pointed out that the content tests were only checked for face validity. Efforts were not invested in rigorously establishing validity and reliability in this pilot effort.

The OScAR 5V (Medley, 1968) was the instrument used to observe teacher social-emotional behavior during the teaching activities. The OScAR 5V is designed for recording information relevant to the affective and interpersonal interaction between teacher and pupil. The OScAR 5V has been described by its creator (Medley, 1968) "as a linear descendant of the Withall technique and a god-child (or step-child) ...of the instruments designed by H. H. Anderson (1945) and Flanders (1960)." The OScAR instrument has evolved through several stages as suggested by the numerals 5V. The present instrument contains eighteen (18) separate categories - four for pupil utterances and fourteen for teacher utterances. Since six of the teacher categories are dual-purpose, however, we can say that there are four categories for classifying pupils and twenty for teacher behaviors. The number of distinct types of events which may be recognized and recorded, however, is considerably greater than twenty-four because of the many ways in which entries and exits may be combined in the same event. The manual for the observational instrument lists sixty-eight different events - thirteen kinds of statements and fifty-five kinds of interchanges - which form the basis of inference about classroom environment made from OScAR records.

## SAMPLE

Four teachers agreed to participate in the pilot GOTE study. They

were all junior high school science teachers at the same junior high school teaching children of generally comparable ability. In consultation with the investigators, each teacher selected two classes which seemed to be comparable in ability. The classes were either on a seventh or eighth grade level. It was assumed that the effect of differences between classes would be reduced by the use of the pre and post test procedure to measure student gains.

## PROCEDURE

The initial step in the procedure was the explanation of the project to the participating teachers. Members of the staff met with teachers several times and discussed the purposes and objectives of the study and outlined the procedures to be followed. The teachers were asked to teach one of their classes for "recall" and one of their classes for "application". The assumption was that experienced teachers could differentiate their teaching style if they knew they were to teach for different kinds of objectives. The teachers prepared lessons for four days of teaching drawing upon the materials provided by the investigators, including the subject matter grids. Help was offered by the investigators in discussing lesson plans, but it was made clear that the teachers were to take the leadership in developing the procedures and approach.

The GOTE unit covered a period of six days. The first day consisted of an explanation to the students of what was happening and a pre-test. This was followed by four days of teaching during which time staff of the GOTE project observed the behavior of teachers. The sixth day consisted of a post-test after which questions were answered and discussions with the students were held about the overall experience.

Observational procedures during the pilot test were of three kinds. Video tapes were made of each teacher in each of the eight classes for one day for a total of eight tapes. Audio-tapes were made of all lessons of all teachers. In addition, two observers were in the room of the teacher during all teaching time. The observers used the OScAR 5V form and noted impressions as the teaching unit proceeded.

There were several problems in the procedure. There was no uniformity among teachers as to whether they would count the work done as credit toward report card marks. Another area of unanticipated confusion lay in the use of homework. One teacher began setting expectations for homework that were quite different from the expectations of the other teachers. Either procedure would have produced new and unexpected variables in the procedure. These issues were dealt with on a post-hoc emergency basis and guidelines were set up to insure a degree of uniformity in the eight classes.

The sound observations and the video observations were successful. The quality of the student response on the audio and video tapes was reasonably good. The observers using OScAR 5V had little difficulty in

keeping track of the behavior of the teacher and in interpreting the behavior on the basis of a consistent set of ground rules. The teachers seemed interested in the project and were pleased to participate from a professional point of view. They were also pleased with the subject matter and with the response of their students.

After the teaching phase of the GOTE was completed and the data was collected, the audio-tapes were analyzed. Each verbal statement was again classified on the basis of psychological process using OScAR 5V; in addition, it was also classified according to instructional goal and content concept. This information was combined and prepared for optical scanning for the purpose of statistical analysis. (See Page No. 7)

## KINDS OF DATA COLLECTED

In all, four kinds of data were collected: (1) recordings, (2) measures of pupil gains, (3) measures of content coverage, and (4) observations of teacher social-emotional interaction. The treatment and display of each type of data is as follows:

The video tapes were simply stored. At times it was valuable to view selected portions of the teaching activities of a teacher. The audio tapes were used to code both the OScAR behavior and the content cells. The great value of these recordings lies in the opportunity they offer to those who would like to examine the teaching activities of the GOTE with some other mode of analysis.

The measures of pupil gains were analyzed in a simple linear mode. Average gains were computed for individual test items per individual pupil within a class. An average gain of .14 per item meant that the pupils in the class gained an average of 3.64 points on a twenty-six item test. Results were reported by class. This provided information about pupil learning by teachers and also by goal. The data was further analyzed to reveal differences in kinds and patterns of learning by contrasting groups of cells, e.g. control cells vs. effects. A value of .14 here would mean gains in content cells exceeded gains in effects cells by 3.64 points. Contrast of cells was established, e.g. control of Air Pollution vs. effects of Air Pollution. These contrasts provided diagnostic information about pupil learning. (Figure 2)

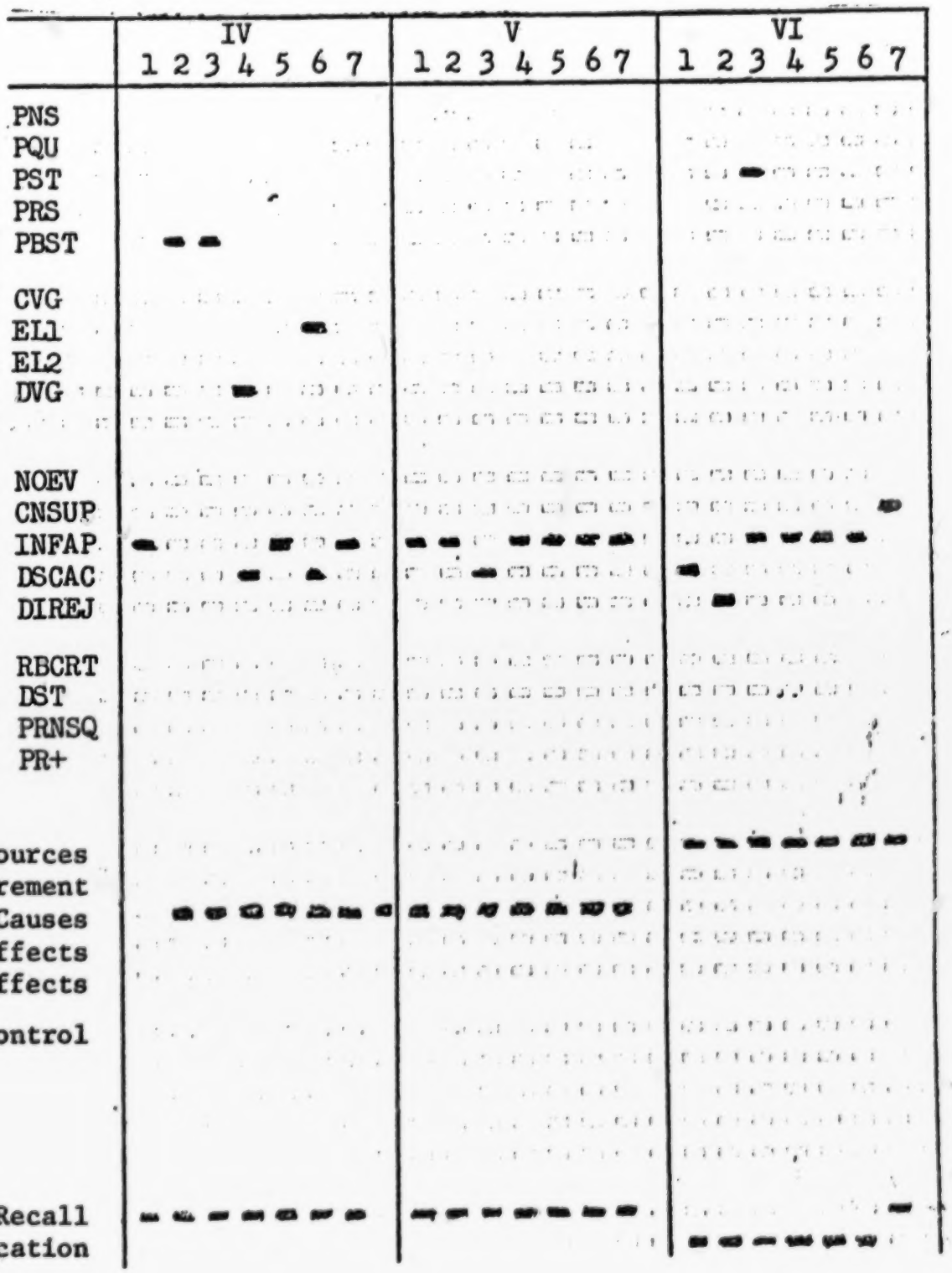
FIGURE 2

| | TEACHER #1 | | TEACHER #2 | | TEACHER #3 | | TEACHER #4 | |
|---|---|---|---|---|---|---|---|---|
| CONTRAST | A | R | A | R | A | R | A | R |
| Total | +.03 | +.06 | +.22 | +.14 | +.09 | +.14 | +.07 | +.08 |
| Application/Recall | -.14 | -.06 | -.09 | -.09 | -.06 | -.07 | +.03 | +.09 |
| Control/Effects | +.03 | +.11 | -.06 | +.06 | +.11 | +.06 | +.18 | +.12 |
| Gen/Spec. Effects | +.09 | +.03 | -.11 | -.18 | -.04 | -.09 | -.08 | -.05 |
| Causes/Facts | 0.0 | -.15 | +.02 | -.03 | +.05 | +0.0 | +.04 | -.06 |
| Facts/Techniques | +.02 | +.27 | +.23 | +.21 | -.09 | +.01 | -.18 | -.05 |

(A- Application R - Recall)

## PROCEDURE FOR CODING GOTE DATA

Three kinds of data were collected concerning teacher behavior; psychological-social behavior, content coverage, and instructional objectives. This information was prepared for optical scanning in such a way that there was a visual display of the interaction between the three types of data over time.




Inspection of the display reveals the simultaneous interaction of the three kinds of data. For example, in column IV 3, the teacher raises a problem structuring question (OScAR data) concerned with the cause of Air Pollution (Content data) which is oriented toward recall (Instructional Objective data). Again, in Column VI3, the pupil offers substantive information concerning the application of information about the sources of Air Pollution to which the teacher gives positive feedback.

Data about content coverage by the teacher was displayed and analyzed in two ways. First, the frequencies were tallied into the content cells. These cells were analyzed for coverage by inspection. Several indexes were established by inspection. For example, the number of cempty cells was noted as an indication of content coverage

Secondly, the frequencies of teacher verbalisms in the content cells were subjected to a three-way analysis of variance, by teacher, goal and visit, and their interactions.

The results of this analysis indicate that there were significant differences in the content coverage of the informational content. Content coverage is a major variable in measurements of teaching effectiveness. (Figure 3)

FIGURE 3

GOTE CONTENT CELLS
ANALYSIS OF VARIANCE

| VARIABLE | | GOAL | TEACHER | VISIT | TEACHER/VISIT |
|---|---|---|---|---|---|
| 1. Sources | R | | 7.56++ | 4.42+ | 2.96+ |
| 2. Measurement | R | | | 8.26+++ | |
| 3. Causes | R | | | 3.71+ | |
| 4. Sp. Effects | R | | 9.04++ | 17.8+++ | 4.83++ |
| 5. Gen. Effects | R | | 3.45+ | | 3.31+ |
| 6. Control | R | | 5.24++ | 16.33+++ | |
| 7. Sources | A | 2.60 | | | |
| 8. Measurement | A | | 4.02+ | 6.44++ | 5.91++ |
| 9. Causes | A | | 98.98+++ | 97.69+++ | 95.28+++ |
| 10. Sp. Effects | A | | 3.23+ | | |
| 11. Gen. Effects | A | | | | |
| 12. Control | A | | 5.17+ | 24.28+++ | 9.53+++ |

R - Recall
A - Application

\+ significance at the .05 level
++ significance at the .01 level
+++ significance at the .001 level

Data concerning teacher social-psychological behavior was collected using OScAR 5V. The sixty-eight (68) possible scores were tabulated and analyzed for variance (ANOVA) considering teacher, goal, visit, recorder, and their interactions. Twenty-one (21) keys reliably identified significant differences between teachers. These items are as follows:

Informing statement ++
Directing statement ++
Rebuking statement ++
Non-substantive question ++

Procedural question - positive ++
Pupil non-substantive - approved ++
Pupil question - not evaluated ++
Pupil question - approved ++
Pupil statement - approved +
Pupil response +
Pupil response - not evaluated ++
Pupil response - approved +
Pupil response - acknowledged +
Problem structuring statement ++
Convergent interchange - not evaluated ++
Convergent interchange - supported ++
Convergent interchange - acknowledged ++
Convergent interchange - neutrally rejected +
Elaborating question (1) - not answered ++
Elaborating interchange (2) acknowledged ++

\+ significance at the .05 level
++ significance at the .01 level

Two items distinguished by visit - thirteen items distinguished teacher by goal - twenty-four items distinguished teacher by visit.

## POSSIBLE INFERENCES

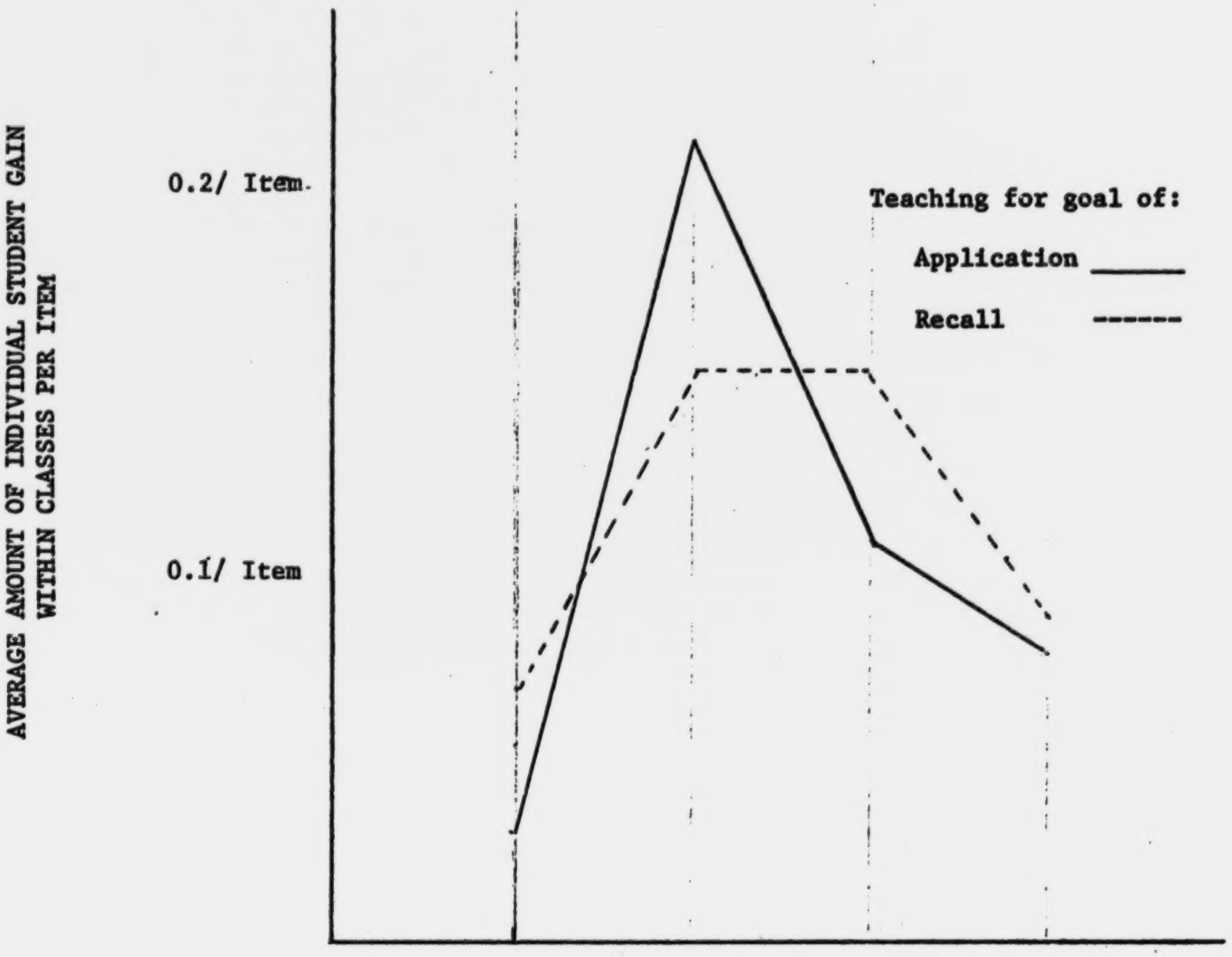
For purposes of this paper, selected facets of each kind of data are high-lighted. Other possible hypotheses are also suggested. The objective is to suggest the range and productivity of the GOTE methodology.

Measures of Student Gains: Inspection of measures of pupil gains reveals that students in the classes of Teacher #2 learned substantially more than the students of the other teachers. This was particularly true when Teacher #2 taught for the instructional goal of application. (Figure 4). The average gain of the children in his class was more than seven times greater than the average gain of the class which learned the least. (Figure 2). It might be said, then, that Teacher #2 was the most effective teacher of the four, particularly when he was teaching for application, and that Teacher #1 was the least effective teacher.

However, inspection of the contrasts of pupil gain scores suggests that there was a difference in the learning of the students by goal and by content cell. It can be hypothesized that Teacher #4 had a teaching style that was more effective in teaching application than recall. Indeed, he was more effective in this sense than any of the other three teachers, all of whose pupils gained more on recall items than on application ones. Also note that when Teacher #4 was supposed to stress recall as his objective, his pupils gained more in application (.09) than when application was his supposed goal (.03). Moreover, his classes learned more about Techniques of Measurement as against Facts of Air Pollution and more about the Control of Air Pollution as contrasted with the Effects of Air Pollution.

FIGURE 4

GOTE ACHIEVEMENT MEASURES
Gains of Pupils X Classes X Teachers




| N of Students by: | | | | |
|---|---|---|---|---|
| Application | 24 | 28 | 27 | 28 |
| Recall | 23 | 29 | 25 | 29 |

Student gains were measured pre and post GOTE using four equivalent test forms. Results are reported as average individual student gains within class per item. (The highest gain of .22 per item is equivalent to a gain of 5.7 on a 26 item test.)

Measures of Content Coverage: It is interesting to trace the content coverage of Teacher #2 (hypothesized as the most effective teacher). He differs from the other teachers in the number of content cells covered. When teaching for the goal of application, the other three teachers has a mean of 27 content cells with no verbal entries. Teacher #2 had only 20 vacant cells. He covered the material more effectively!

The analysis of variance of the content cells revealed differences and similarities in the way the teacher covered the subject matter. This data provides rich ground for inferences about teacher content strategies. (Teacher by visit interactions.)

Measures of Teacher Social-Psychological Behavior: Teacher #2 again stands out. He exhibits a different pattern of behavior than the other teachers as a group. The differences between Teacher #2 and Teacher #1 when teaching for the goal of application are most interesting. In a sense, they are a comparison of the behavior of the most effective teacher with the behavior of the least effective teacher. For purposes of simple contrast, the behaviors on which these teachers loaded both the least and the most are displayed. This provides a glimpse of the most prominent behavior characteristics of these two teachers.

TEACHER #2 ON GOAL OF APPLICATION (Hypothesized as the most effective teacher)
Scored highest of all teachers on the following items:

Informing statements
Pupil non-substantive - approved
Pupil questions - not evaluated
Pupil questions - approved
Pupil statements - approved
Pupil responses - acknowledged
Convergent interchanges - supported
Elaborating questions - not answered

TEACHER #1 ON GOAL OF APPLICATION (Hypothesized as the least effective teacher)
Scored highest of all teachers on the following items:

Directing statements
Rebuking statements
Non-substantive statements
Pupil responses - not evaluated
Problem structuring statements
Convergent interchanges - not evaluated
Convergent interchanges - acknowledged
Convergent interchanges - neutrally rejected

Scored lowest of all teachers on the following items;

Informing statements
Procedural questions - positive

There are many other ways of analyzing the data produced by this pilot GOTE. The three kinds of data have yet to be combined to examine the congruence of teacher behavior, content coverage, and student learning. Several other kinds of indexes can be developed. An example being examined is that of "individual teacher strategies" which is defined as the frequency pattern by visit of items (which is reflected in the interaction "teacher by visit" in the analysis of variance).

GOTE data output provides a basis for analyses which combine quantitative measures with clinical or case study detail. These possibilities will be explored further in a forthcoming publication.

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# APPENDIX

## APPENDIX

### THE 68 EVENTS RECORDED ON OScAR 5V

| IDENTIFYING NUMBER | | ABBRE-VIATION | DEFINITION |
|---|---|---|---|
| 02. | Considering Statement | CNSUP | Teacher shows consideration for pupil or awareness of his desires |
| 03. | Informing Statement | INFAP | Teacher gives information |
| 04. | Describing Statement | DSCAC | Teacher describes procedure or makes statement not otherwise classifiable |
| 05. | Directing Statement | DIREJ | Teacher directs pupil to do something |
| 06. | Rebuking Statement | RBCRT | Teacher rebukes pupil |
| 07. | Desisting Statement | DST | Teacher directs pupil to stop doing something |
| 08. | Non-Substantive Question | PRNS | Teacher asks non-substantive question not otherwise classifiable |
| 09. | Procedural Question Positive | PR+ | Teacher offers pupil a choice of actions |
| 10. | Pupil Non-Substantive Utterance | PNS | Pupil speaks to pupil about non-substantive matters |
| 11. | Pupil Non-Substantive Not Evaluated | PNS NOEV | Teacher does not explicitly acknowledge non-substantive pupil utterance before continuing lesson |
| 12. | Pupil Non-Substantive Supported | PNS CNSUP | Teacher praises or responds with consideration to a non-substantive pupil utterance |
| 13. | Pupil Non-Substantive Approved | PNS INFAP | Teacher indicates that non-substantive pupil statement is acceptable, or answers non-substantive pupil question |
| 14. | Pupil Non-Substantive Acknowledged | PNS DSCAC | Teacher acknowledges non-substantive pupil utterance without indicating whether it is acceptable or not |
| 15. | Pupil Non-Substantive Neutrally Rejected | PNS DIREJ | Teacher indicates that non-substantive pupil statement is unacceptable, or refuses to answer non-substantive pupil question |
| 16. | Pupil Non-Substantive Criticized | PNS RBCRT | Teacher criticizes non-substantive pupil utterance |

THE 68 EVENTS RECORDED ON OScAR 5V (cont'd.)

| IDENTIFYING NUMBER | NAME | ABBREVIATION | DEFINITION |
|---|---|---|---|
| 17. | Pupil Procedural Question Negative | PNS DST | Teacher refuses permission asked for by pupil |
| 18. | Pupil Procedural Question Neutral | PNS PRNS | Teacher neither gives nor refuses permission asked for by pupil |
| 19. | Pupil Procedural Question Positive | PNS PR+ | Teacher gives permission asked for by pupil |
| 20. | Pupil Question | PQU | Pupil addresses a substantive question to another pupil |
| 21. | Pupil Question Not Evaluated | PQU NOEV | Teacher does not explicitly acknowledge substantive pupil question before continuing lesson |
| 22. | Pupil Question Supported | PQU CNSUP | Teacher praises substantive pupil question |
| 23. | Pupil Question Approved | PQU INFAP | Teacher answers substantive pupil question |
| 24. | Pupil Question Acknowledged | PQU DSCAC | Teacher postpones answering substantive pupil question |
| 25. | Pupil Question Neutrally Rejected | PQU DIREJ | Teacher refuses to answer substantive pupil question |
| 26. | Pupil Question Criticized | PQU RBCRT | Teacher criticizes substantive pupil question |
| 30. | Pupil Statement | PST | Pupil speaks to another pupil about substantive content |
| 31. | Pupil Statement Not Evaluated | PST NOEV | Teacher does not explicitly acknowledge substantive pupil statement before continuing lesson |
| 32. | Pupil Statement Supported | PST CNSUP | Teacher praises substantive pupil statement |
| 33. | Pupil Statement Approved | PST INFAP | Teacher indicates that substantive content of pupil statement is correct or acceptable |

THE 68 EVENTS RECORDED ON OScAR 5V(cont'd.)

| IDENTIFYING NUMBER | NAME | ABBREVIATION | DEFINITION |
|---|---|---|---|
| 34. | Pupil Statement Acknowledged | PST DSCAC | Teacher acknowledges substantive pupil statement without indicating whether it is correct or acceptable |
| 35. | Pupil Statement Neutrally Rejected | PST DIREJ | Teacher indicates that substantive content of pupil statement is incorrect or unacceptable |
| 36. | Pupil Statement Criticized | PST RBCRT | Teacher criticizes substantive pupil statement |
| 40. | Pupil Response | PRS | Different pupil speaks in inter-pupil discussion |
| 41. | Pupil Response Not Evaluated | PRS NOEV | Teacher does not acknowledge pupil's answer to previous question before continuing lesson |
| 42. | Pupil Response Supported | PRS CNSUP | Teacher praises pupil's answer to previous question |
| 43. | Pupil Response Approved | PRS INFAP | Teacher indicates that pupil's answer to previous question is correct or acceptable |
| 44. | Pupil Response Acknowledged | PRS DSCAC | Teacher acknowledges pupil's answer to previous question without indicating whether it is correct or acceptable |
| 45. | Pupil Response Neutrally Rejected | PRS DIREJ | Teacher indicates that pupil's answer to previous question is incorrect or unacceptable |
| 46. | Pupil Response Criticized | PRS RBCRT | Teacher criticizes pupil's answer to previous question |
| 50. | Problem Structuring Statement | PBST | Teacher sets a problem or raises a question without indicating who is to answer it. |
| 60. | Convergent Question Not Answered | CVG | Teacher asks pupil a question which calls for one right answer, but pupil does not reply |
| 61. | Convergent Interchange Not Evaluated | CVG NOEV | Teacher does not acknowledge pupil's answer to convergent question before continuing lesson |
| 62. | Convergent Interchange Supported | CVG CNSUP | Teacher praises pupil for giving the right answer to convergent question |
| 63. | Convergent Interchange Approved | CVG INFAP | Teacher indicates that pupil's answer to convergent question is the right one |

| IDENTIFYING NUMBER | NAME | ABBREVIATION | DEFINITION |
|---|---|---|---|
| 64. | Convergent Interchange Acknowledged | CVG DSCAC | Teacher acknowledges pupil's answer to convergent question but does not indicate whether it is the right one |
| 65. | Convergent Interchange Neutrally Rejected | CVG DIREJ | Teacher indicates that pupil's answer to convergent question is not the right one |
| 66. | Convergent Interchange Criticized | CVG RBCRT | Teacher criticizes pupil's response to convergent question |
| 70. | Elaborating Question (1) Not Answered | EL1 | Teacher asks pupil to extend or elaborate his answer, but pupil does not respond |
| 71. | Elaborating Interchange (1) Not Evaluated | EL1 NOEV | Teacher does not acknowledge pupil's elaboration of his answer before continuing lesson |
| 72. | Elaborating Interchange (1) Supported | EL1 CNSUP | Teacher praises pupil's elaboration of his own answer |
| 73. | Elaborating Interchange (1) Approved | EL1 INFAP | Teacher indicates that pupil's elaboration of his own answer is acceptable |
| 74. | Elaborating Interchange (1) Acknowledged | EL1 DSCAC | Teacher acknowledges pupil's elaboration of his own answer without indicating whether it is acceptable |
| 75. | Elaborating Interchange (1) Neutrally Rejected | EL1 DIREJ | Teacher indicates that pupil's elaboration of his own answer is unacceptable |
| 76. | Elaborating Interchange (1) Criticized | EL1 RBCRT | Teacher criticizes pupil's elaboration of his own answer |
| 80. | Elaborating Question (2) Not Answered | EL2 | Teacher asks pupil to elaborate on another pupil's comment, but pupil does not answer |
| 81. | Elaborating Interchange (2) Not Evaluated | EL2 NOEV | Teacher does not acknowledge pupil's elaboration of another pupil's remark before continuing lesson |
| 82. | Elaborating Interchange (2) Supported | EL2 CNSUP | Teacher praises pupil's elaboration of another pupil's remark |
| 83. | Elaborating Interchange (2) Approved | EL2 INFAP | Teacher indicates that pupil's elaboration of another pupil's remark is acceptable |

THE 68 EVENTS RECORDED ON OScAR 5V

| IDENTIFYING NUMBER | NAME | ABBREVIATION | DEFINITION |
|---|---|---|---|
| 84. | Elaborating Interchange (2) Acknowledged | EL2 DSCAC | Teacher acknowledges pupil's elaboration of another pupil's remark, but does not indicate whether it is acceptable |
| 85. | Elaborating Interchange (2) Neutrally Rejected | EL2 DIREJ | Teacher indicates that pupil's elaboration of another pupil's remark is not acceptable |
| 86. | Elaborating Interchange (2) Criticized | EL2 RBCRT | Teacher criticizes pupil's elaboration of another pupil's remark |
| 90. | Divergent Question Not Answered | DVG | Teacher asks pupil a question to which more than one answer may be acceptable or correct, but pupil does not respond |
| 91. | Divergent Interchange Not Evaluated | DVG NOEV | Teacher does not acknowledge pupil's answer to divergent question before continuing lesson |
| 92. | Divergent Interchange Supported | DVG CNSUP | Teacher praises pupil's answers to divergent question |
| 93. | Divergent Interchange Approved | DVG INFAP | Teacher indicates that pupil's answer to divergent question is acceptable |
| 94. | Divergent Interchange Acknowledged | DVG DSCAC | Teacher acknowledges pupil's answer to divergent question without indicating whether it is acceptable |
| 95. | Divergent Interchange Neutrally Rejected | DVG DIREJ | Teacher indicates that pupil's answer to divergent question is not acceptable |
| 96. | Divergent Interchange Criticized | DVG RBCRT | Teacher criticizes pupil's answer to divergent question |